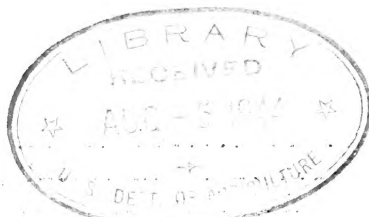


Historic, Archive Document

Do not assume content reflects current scientific knowledge, policies, or practices.

1.9
En 83 Et
ET-13



May 1934

A DEVICE FOR CUTTING SOIL SAMPLES TO ANY DESIRED THICKNESS

By Louis Koblitsky, Division of Japanese and Asiatic Beetles,
Bureau of Entomology, U. S. Department of Agriculture

In connection with the use of lead arsenate on turf to control the larvae of the Japanese beetle, it was necessary to know the concentration of the arsenate in each 1-inch layer to a depth of 3 inches at different periods after application. It was found that when a tin can (2.625 inches inside diameter and 3.5 inches high) was pressed into the turf until the bottom of the can was level with the turf and then taken up, a solid core of soil could be obtained, except in those cases where the soil was very hard or stony. When the bottom of the can was cut away and the core of soil was pushed out and cut into 1-inch layers, suitable samples for analysis were obtained. With a large number of samples, some difficulty was encountered in forcing the soil out of the can and in getting layers of exactly 1 inch in thickness. A satisfactory device has been made for uniformly cutting these cores of soil.

This device and the other equipment necessary in cutting the soil samples are shown in figures 1, 2, and 3.

The device consists of a braced soil stop (SS), ring rests (RR), saddle (S), guide support (GS) of cast iron, plunger (P), screw feed (SF), handle (H), and rings (R) of machined steel. The accessories are a can opener (CO), a steel knife (K), and the sample container (C).

In constructing the device the controlling factors are the width of the soil samples desired and the inside diameter of the sample container. The saddle is made with a curvature so that the sample container fits snugly when in operating position (fig. 3). The rings are made the same width as the soil section wanted and with the inside diameter identical with the inside diameter of the sample container. A small section is cut away so that the movement of the soil can be observed. The ring rests are made so that, when a ring is put in operating position (fig. 3), the inside surface of the ring is a continuation of the inside surface of the sample container. The plunger is a steel disk with a diameter slightly smaller than the inside diameter of the sample container. The guide support is made so that the centers of the plunger and screw feed are in line with the central axis of the sample container when in position during operation (fig. 3). This device was made in 1931 at a cost of approximately \$15.

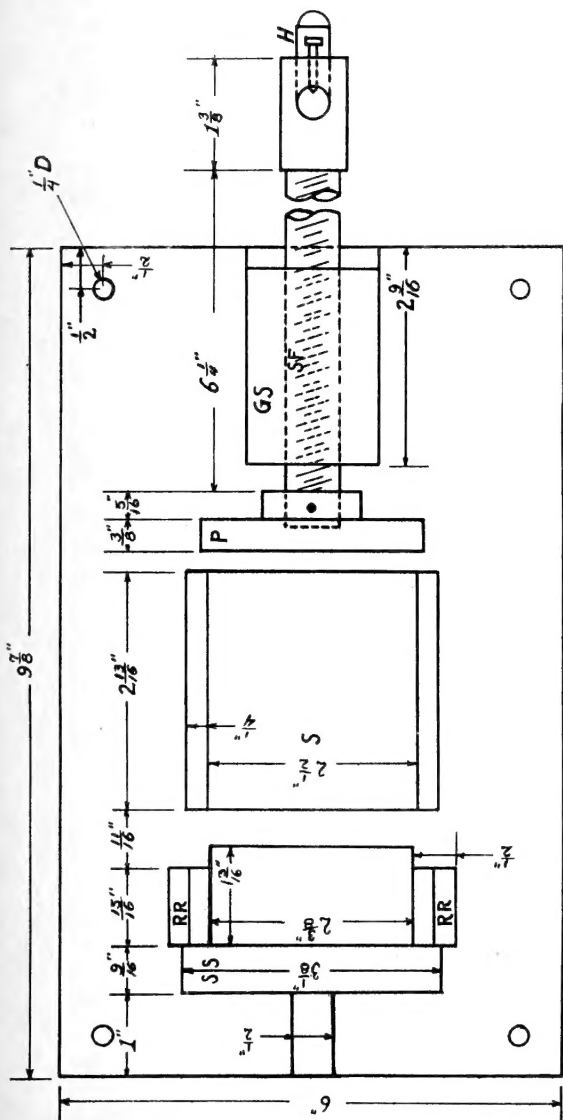
The device is secured to the top of a table or bench. The can opener is fastened in a convenient position to the same table or bench. The fixed end of the container is removed with the can opener. The lid is removed and the cylinder of soil is placed in the saddle (fig. 3). The ring is put in position over the ring rests and the plunger is fed forward until the soil is pushed from the container and against the soil stop, as seen through the sections cut away in the ring. Care should be taken to discontinue feeding the plunger forward as soon as the soil reaches the soil stop, so as not to compress the soil. The plunger is withdrawn a trifle, and a sharp knife is passed between the ring and the sample container, cutting off a section of soil the width of the ring. The ring is removed, another substituted, and the process repeated.

Explanation of Illustrations

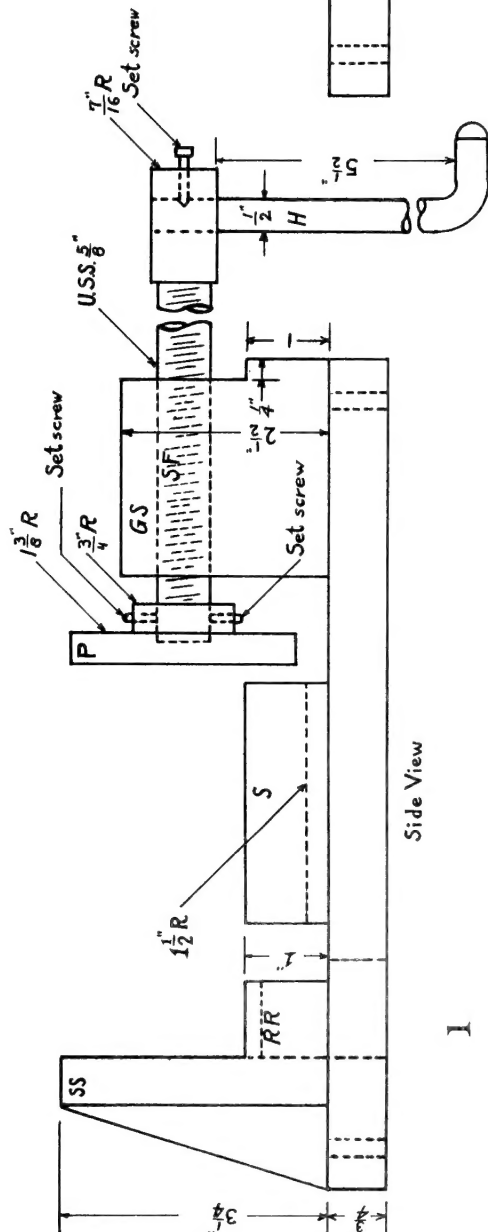
Figure 1.--Detail drawing of machine for cutting soil samples.

Figure 2.--Machine and other equipment necessary for cutting samples.

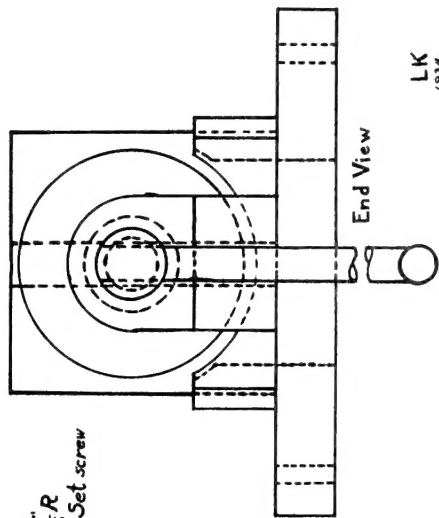
Figure 3.--Sample container and ring in operating position.



Top View



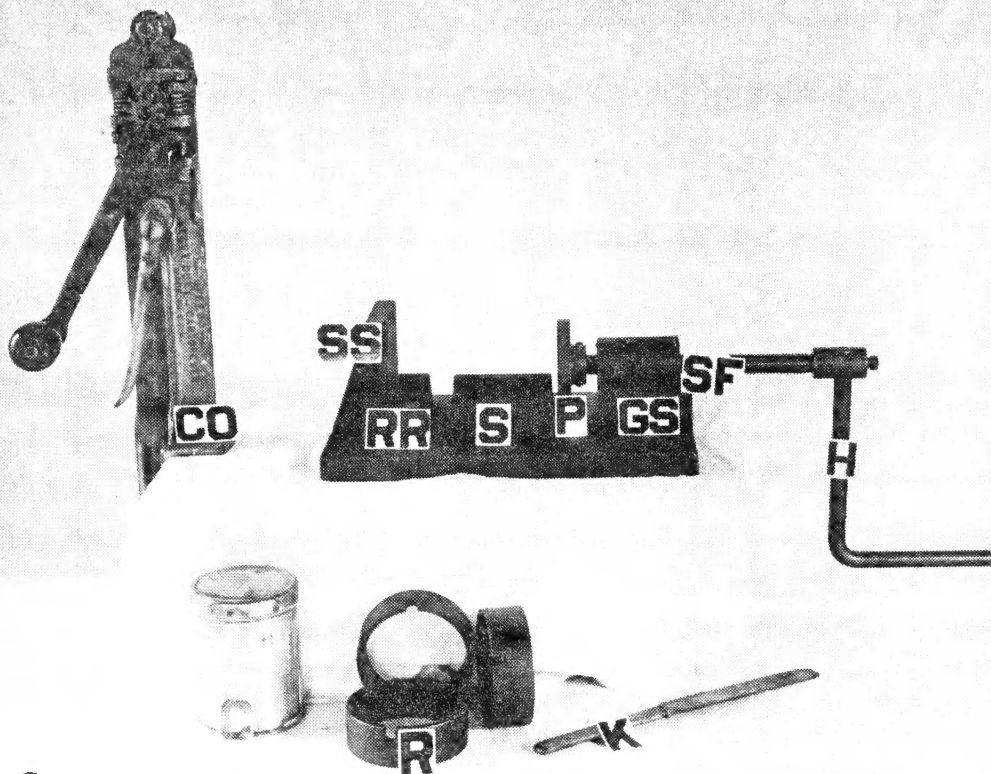
Side View



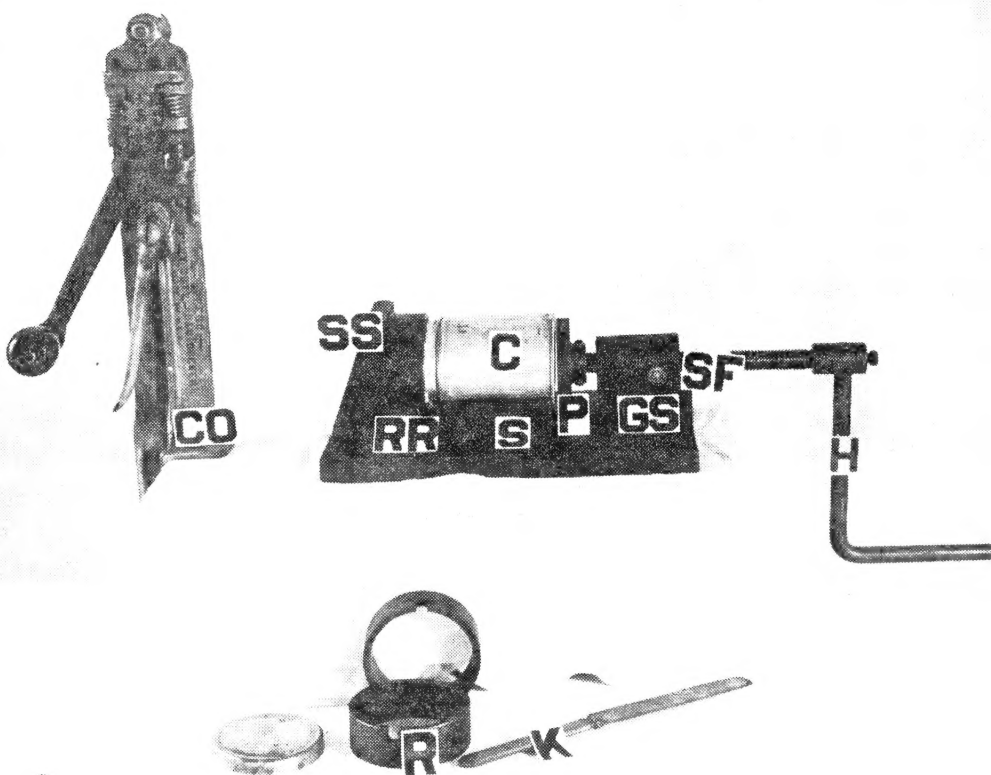
End View

LK
1934

Soil Sample Gutting Machine
 SS --- Soil stop
 RR --- Ring rest
 S --- Saddle
 P --- Plunger
 GS --- Guide support
 SF --- Screw feed
 H --- Handle



2



3

